

ABSTRACT

A tunable cavity resonator for filtering radiation in the optical and IR wavelengths and a method for fabricating same. The resonator having a pair of reflectors, one in fixed relationship to a substrate and the other formed upon a suspended moveable membrane disposed a cavity length from the one reflector. The resonator also including a pair of spaced apart electrodes either constituted by the reflectors or juxtaposed therewith, which are electrostatically operable to move the membrane and other reflector relative to the one reflector. A first reflector layer is deposited on the substrate to form the one reflector. A sacrificial layer having a high etch selectivity for releasing the membrane in a suspended and spaced relationship from the one reflector is formed on the first reflector layer. The membrane is deposited on the sacrificial layer using a deposition technique characterised by providing the required intrinsic stress in the membrane. A second reflector layer is formed on the membrane to form the other reflector. The second reflector layer is patterned in accordance with a prescribed membrane geometry and then etched to achieve the same. The sacrificial layer is then initially etched to remove regions thereof down to the first reflector layer on the substrate exposed by the etching. Those regions of the sacrificial layer that are intended to function as the residual support structure of the membrane are then protected with photoresist and the remaining unprotected regions of the sacrificial layer are finally etched, removing the protection from the support structures to suspend the membrane in substantially parallel relation to the first reflector layer.